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EASA Update on Use of Magnesium Alloys

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The current Special Conditions

In 2015 EASA issued Special Conditions applicable to the A350-941 to allow the use of magnesium alloys for seat components:

1) It must be shown that the use of magnesium alloys in the proposed passenger seat components (legs, spreaders, cross-tubes, seat back frame, lower baggage bar, tray table arms) does not reduce post-crash or in-flight fire safety as compared with the use of conventional aluminium alloys.

2) In addition, it must be shown that the magnesium alloy, when ignited, will not pose a hazard to fire fighters and/or evacuees, when using common fire suppression agents.

EASA Update on Use of Magnesium Alloys

- EASA intends to revise the Special Conditions to require testing as per Chapter 25 of the FAA Aircraft Materials Fire Test Handbook.

- The revised SC include an Interpretative Material section that introduces criteria to allow the use of magnesium alloys for parts other than those addressed in the initial issue of the Special Conditions ((e.g., legs, spreaders, cross-tubes, seat back frame, and lower baggage bar).

- The Interpretative Material section is based on what has been developed by the Task Group of the International Aircraft Materials Fire Testing WG in the last two years.

The revised Special Conditions

The Special Conditions applicable to the A350-941 will be revised to read as follows:

1) Magnesium alloys may be used in aircraft seat construction provided they are tested to and meet the flammability performance requirements in the FAA Fire Safety Branch document: Aircraft Materials Fire Test Handbook - DOT/FAA/AR-00/12, Chapter 25, Oil Burner Flammability Test for Magnesium Alloy Seat Structure.

2) In addition, it must be shown that the magnesium alloy, when ignited, will not pose a hazard to fire fighters and/or evacuees, when using common fire suppression agents.

Interpretative Material related to the revised Special Conditions

Substantiation through successful testing as per Chapter 25 of the Fire Test Handbook is acceptable for seat parts that meet the following criteria:

1) The SAV ratio (with dimensions expressed in inches) of the part must not exceed 20, except that for hollow parts, such as backrest frames, cross tubes or baggage bars, the SAV ratio must not exceed 40.

2) The height of the part from the floor does not exceed 60 inches at any point, i.e. is consistent with that of seat parts. This is due to the limited scope of the full scale testing so far conducted by the FAA Tech Center.

3) The risk of ignition during flight due to exposure to potential ignitions sources (electrical systems, batteries, etc.) is insignificant.

Future Steps (1/2)

- The discussion on the text of the revised Special Conditions and associated Interpretative Material has been finalized with Airbus.
- However, due to fact that there is no active EASA project involving the use of magnesium alloys for seat parts, the official update and publication of the new A350 SC has been postponed.
- Public comment period should occur in **Q1 2018**.
- EASA is ready to discuss the applicability of the same Special Conditions and of similar Interpretative material to the use of magnesium alloys for parts of interior components other than seats in accessible areas occupied by crew or passengers.

Future Steps (2/2)

- EASA has been approached to discuss applications involving the use of magnesium alloys in **inaccessible areas** of the pressurized fuselage of large aeroplanes.

- New Special Conditions will have to be developed in coordination with the FAA in order to:
  - mandate certification testing based on the modified radiant panel test method currently being developed at the FAA Tech Center.
  - identify any additional installation limitations

- EASA is considering to release a Certification Memorandum (Target for public consultation: **Q2 2018)** to clarify the options available to applicants to achieve certification of installation of parts made of magnesium alloys.

EASA
European Aviation Safety Agency

Any Questions?

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